Why you should let your “long-only” manager short stocks

The tremendous growth in the hedge fund industry over the past decade has encouraged many long-established investment firms to think about the potential benefits of shorting stocks as part of their more traditional heretofore long-only investment strategies. Is that a good idea?

In approaching this question, we find it very helpful to think in terms of information ratio. Information ratio, or the ratio of excess return to tracking error, is a measure of the risk efficiency with which a manager delivers excess returns. While investors may be tempted to dismiss information ratio in favor of total return or excess return as a measure of manager skill (“you can’t eat information ratios”), those managers who can deliver higher information ratios will ultimately test the patience of the investor far less often. We choose to focus on information ratio as a metric to efficiently reach for more return, not as a substitute for achieving higher levels of return.

The higher the information ratio, the greater the odds that a manager will outperform over any time horizon, generally resulting in fewer “false negative” manager terminations. All too often this short term decision cycle results in adverse selection — firing managers at the bottom of their performance cycle and hiring their replacements at the top of theirs. See a companion piece, “Reach for More Return — But Don’t Hurt Yourself”1 for a more complete discussion of this phenomenon.

But why does the ability to short stocks raise information ratios? To answer this question we will first look at a framework for predicting information ratios, use that framework to understand the impact on information ratios of concentrating long-only portfolios, and then extend that framework to portfolios that include shorts.

In 1989, Richard Grinold2 developed a framework which was extended in 2002 by Roger Clarke and his co-authors.3 This framework evolved to predict the ex-ante information ratio of a manager based on three variables — breadth, skill and freedom of implementation.

They measured breadth as the number of intentional and independent bets (positive or negative) in the portfolio (N), and skill as the information coefficient (IC), or correlation between the manager’s expected excess returns and the subsequent excess returns of the assets. Implementation was measured as the Transfer Coefficient (TC), or correlation between the manager’s bets and predicted returns for each stock.

**Efficiency = Skill * Breadth * Freedom**

\[
IR = IC \times \sqrt{N \times TC}
\]

Where: 
- **IR** = Information Ratio  
- **IC** = Information Coefficient  
- **N** = Number of Independent Bets  
- **TC** = Transfer Coefficient

The IC for the perfect manager is 1, and a manager whose insights were random with no skill would have an IC of 0. Equally impactful was the second term in the equation. The higher the number of uncorrelated and intentional bets, the greater the efficiency of the portfolio — an intuitive framework.

**The Transfer Coefficient**

The third term in this equation is the Transfer Coefficient, a measure of how closely the portfolio bets aligned with the manager’s predicted returns for each stock. A manager with complete freedom of implementation could theoretically achieve a TC as high as 1. To the extent that a manager faced constraints, her information ratio would decline. A manager with constraints so binding that they kept her from making any bets that reflected her insights would have a TC of zero, and therefore an information ratio of zero.

For a manager with a given research universe (N) and level of return prediction skill (IC), her success in producing risk adjusted returns is then dependent on how efficiently she places her bets — her Transfer Coefficient. In fact, this lever is more powerful than you might assume at first glance.

In Exhibit One, we can see that using a non-linear optimizer to construct long-only portfolios with different levels of tracking errors, the more concentrated the portfolio and the more common

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1. Reach for More Return — But Don’t Hurt Yourself
2. Richard Grinold
3. Roger Clarke and co-authors
factor risk the portfolio takes on, the lower the initial setup Transfer Coefficient. Further amplifying this effect is the fact that most high tracking error managers do not manage their common factor risks as effectively as the optimizer does in the example above, resulting in even lower information ratios as uncompensated risk is assumed. This clearly illustrates why a manager with a given source of investment insights might expect an information ratio for a concentrated long-only portfolio less than half the level of that for an enhanced index portfolio.

While this might make sense at first, making a large 3.75% positive bet in his most attractive name, in a long-only environment this also leads to many unintentional bets.

Stocks B and C, which the manager also expects to outperform, have negative bets versus the benchmark. Stocks F and G, which the manager expects to significantly underperform, have only small negative bets, limited to their capitalization weight.

Once the short sale constraint is lifted, however, the manager can now scale his bets more closely to his insights. This results in making the same amount of bets as the long-only portfolio, 7.50%. However, if the manager’s forecasted returns are realized, the excess return from the long-only portfolio would be 0.74%, and the long/short portfolio 1.25%. Thus we can see the results from the lifting of the short-sale constraint, and how it can enable a portfolio to achieve higher returns for the same level of risk and insight.

Ideally, managers have equally insightful opinions on stocks they think will perform well, and those that should perform poorly. Unfortunately, in a long-only portfolio against any benchmark, their ability to exploit negative insights is extremely limited. In Exhibit Three, we can see that only 16 names in the S&P 500 are large enough components to allow the manager to make a 1% or greater negative bet by choosing not to own the stock. This inefficiency actually grows with more equal weighted benchmarks such as the Russell 2000, where the largest weight of any name is less than 0.30%. This asymmetry in potential bets can result in a significant waste of investment insight.

We can see the effect of portfolio concentration by comparing the tracking error of “typical” portfolios. In Exhibit Four, we simulate portfolios of declining numbers of stocks. First, we build an imaginary portfolio (the thin red line) whose portfolio risk comes purely from stock specific risk, what we normally think of as stockpicking. As the portfolio becomes more concentrated, the power of diversification of these (by

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### Exhibit One: The impact of concentration on transfer coefficients in long-only portfolios

<table>
<thead>
<tr>
<th>Portfolio tracking error</th>
<th>Transfer Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0%</td>
<td>0.50</td>
</tr>
<tr>
<td>1.5%</td>
<td>0.45</td>
</tr>
<tr>
<td>2.0%</td>
<td>0.40</td>
</tr>
<tr>
<td>3.0%</td>
<td>0.34</td>
</tr>
<tr>
<td>4.0%</td>
<td>0.30</td>
</tr>
<tr>
<td>5.0%</td>
<td>0.27</td>
</tr>
<tr>
<td>6.0%</td>
<td>0.24</td>
</tr>
<tr>
<td>8.0%</td>
<td>0.20</td>
</tr>
</tbody>
</table>

Source: JPMorgan Asset Management

Theoretical optimized portfolios. Results will vary for different alphas, benchmarks, risk parameters and optimization engines.

### Exhibit Two: Alternative bet structures for a manager with and without a short sale constraint

<table>
<thead>
<tr>
<th>Stock</th>
<th>Expected Return</th>
<th>Benchmark</th>
<th>Long-Only Portfolio</th>
<th>Long-Only Bet</th>
<th>Long/Short Portfolio</th>
<th>Long/Short Bet</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>20%</td>
<td>0.25%</td>
<td>4.00%</td>
<td>3.75%</td>
<td>2.50%</td>
<td>2.50%</td>
</tr>
<tr>
<td>B</td>
<td>10%</td>
<td>0.50%</td>
<td>0.00%</td>
<td>-0.50%</td>
<td>1.25%</td>
<td>1.25%</td>
</tr>
<tr>
<td>C</td>
<td>5%</td>
<td>1.00%</td>
<td>0.00%</td>
<td>-1.00%</td>
<td>0.00%</td>
<td>0.00%</td>
</tr>
<tr>
<td>D</td>
<td>0%</td>
<td>1.50%</td>
<td>0.00%</td>
<td>-1.50%</td>
<td>0.00%</td>
<td>0.00%</td>
</tr>
<tr>
<td>E</td>
<td>-5%</td>
<td>0.25%</td>
<td>0.00%</td>
<td>-0.25%</td>
<td>0.00%</td>
<td>0.00%</td>
</tr>
<tr>
<td>F</td>
<td>-10%</td>
<td>0.25%</td>
<td>0.00%</td>
<td>-0.25%</td>
<td>-1.25%</td>
<td>-1.25%</td>
</tr>
<tr>
<td>G</td>
<td>-20%</td>
<td>0.25%</td>
<td>0.00%</td>
<td>-0.25%</td>
<td>-2.50%</td>
<td>-2.50%</td>
</tr>
</tbody>
</table>

Total Bets (proxy for risk) 7.50%
Active return if expected returns realized 0.74%

Size and direction of bets consistent with expected returns
definition) uncorrelated returns diminishes. However, the observed tracking error of actual manager portfolios (the heavier green line) rises much more quickly than this, illustrating the impact of non-stock specific risks — both intentional and unintentional — in concentrated portfolios. This rapid increase in risk would not necessarily decrease the information ratio if the incremental excess return that resulted from this concentration increased as rapidly as the risk. However, the payoff from many of these risks is lower than for the manager’s stock level insights, causing portfolio information ratios to fall.

Since most investors have a need to reach for higher levels of excess return, and since it would be unreasonable to believe that these higher returns would not be accompanied by higher levels of tracking error, how does an investor increase risk and return, but not suffer deterioration in the transfer coefficient, leading to a decrease in information ratio? The answer, as we saw in Exhibit Two, lies in relaxing the constraint on shorting.

In Exhibit Five, we see the results of using a non-linear optimizer using random alphas and a risk model to construct optimized portfolios with different levels of relaxation of the short sale constraint at two different levels of tracking error — 2% and 6%. The long-only portfolio is a fully invested portfolio with no other constraints optimized versus the S&P 500. The

“110/10” portfolio is 110% of invested capital long, 10% of invested capital short, optimized versus the S&P 500. Each of the 120/20 through 150/50 has higher degrees of gross exposure, but a net of 100% market exposure, and the same tracking error. The 100/100 portfolio is 100% of invested capital long, 100% of invested capital short, and the targeted tracking error of long versus short. This hypothetical market neutral portfolio could then be equitized with S&P 500 futures, resulting in the same tracking error to the S&P 500.

We can draw two conclusions from this example. First, relaxing the short sale constraint has a significant positive impact on transfer coefficients and, by extension, information ratios. Second, a portfolio consisting of 130% long and 30% short can theoretically achieve on the order of 88% of the efficiency of the fully long/short portfolio at 2% tracking error, and 82% of the efficiency at 6% tracking error. A little bit of shorting goes a long way.

For a more complete understanding of the Grinold and Clarke frameworks, as well as extensions to the framework we have developed to take into account turnover and transaction costs, please see a companion piece, “Extending the Fundamental Law of Investment Management”.

Does every manager have the tools to successfully use shorts?

Winners and losers in active management are separated by slim margins of relative insight. The degree of potential improvement in investment results that might be achieved by allowing shorting in portfolios with more traditional objectives certainly warrants strong consideration. Of course, shorting stocks is not a natural fit for many managers, including some with excellent long-only track records. We see several obstacles to aspiring short-sellers.
An investment process that focuses on analyzing a narrow range of stocks. Some managers focus their research efforts intensively on a handful of names in which they have developed very high conviction. That's fine for running a concentrated long-only portfolio, but doesn't really lend itself to finding and building conviction in short ideas. Those whose insights are spread across a wider coverage set are more likely to find good long and short ideas.

A lack of experience in managing the risk of short positions. When a long-only manager takes a long position in a name and is wrong, his bet gets smaller as the stock loses relative value. With a mistake on the short side, the opposite happens — the bet grows in size, and the potential losses are unlimited. Long-only managers will have had little experience of this, although those that misjudged for example the meteoric rise of Microsoft in the '90s will find it familiar, because an underweight bet in a long only portfolio acts like a short position in this regard. Actual experience of managing this risk is therefore a valuable skill set.

Shorting stocks is administratively complex. Managers need to understand the various regulations, of course, and successfully deal with prime brokers who arrange the loan of stocks for short positions. These skills can be learned, but again managers with actual experience in the field will have an advantage over new arrivals. Clearly not every manager has the appropriate alpha source and experience set necessary to support successful shorting. However, some managers have proven that their insights into potential underperformers are as powerful as those into potential outperformers. Many of those managers have also proven that they have the risk management and logistical skills to appropriately manage short positions. Relaxing this single constraint for those managers who are able to responsibly and successfully utilize shorting can result in significant gains in risk adjusted returns.

Footnotes

Additional References

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